

expected normal operating temperature does not exceed 400 °F. Carbon steel bolts must have heavy hexagon heads in accordance with ASME B18.2.1 (incorporated by reference, see 46 CFR 56.01-2) and must have heavy semi-finished hexagonal nuts in accordance with ASME/ANSI B18.2.2 (incorporated by reference, see 46 CFR 56.01-2), unless the bolts are tightly fitted to the holes and flange stress calculations taking the bolt bending stresses into account are submitted. When class 250 cast iron flanges are used or when class 125 cast iron flanges are used with ring gaskets, the bolting material must be carbon steel conforming to ASTM A 307 (incorporated by reference, see 46 CFR 56.01-2), Grade B.

(c) Alloy steel stud bolts must be threaded full length or, if desired, may have reduced shanks of a diameter not less than that at the root of the threads. They must have heavy semi-finished hexagonal nuts in accordance with ANSI B18.2.2.

(d) All alloy bolts or studs and accompanying nuts are to be threaded in accordance with ANSI/ASME B1.1 (incorporated by reference; see 46 CFR 56.01-2), Class 2A external threads, and Class 2B internal threads (8-thread series 8UN for one inch and larger).

(e) (*Reproduces 108.5.1*) Washers, when used under nuts, shall be of forged or rolled material with steel washers being used under steel nuts and bronze washers under bronze nuts.

[CGFR 68-82, 33 FR 18843, Dec.18, 1968, as amended by CGD 77-140, 54 FR 40605, Oct. 2, 1989; USCG-2000-7790, 65 FR 58460, Sept. 29, 2000; USCG-2003-16630, 73 FR 65176, Oct. 31, 2008]

Subpart 56.30—Selection and Limitations of Piping Joints

§ 56.30-1 Scope (replaces 110 through 118).

The selection and limitation of piping joints must be as required by this subpart rather than as required by 110 through 118 of ASME B31.1 (incorporated by reference; see 46 CFR 56.01-2); however, certain requirements are marked “reproduced” in this subpart.

[USCG-2003-16630, 73 FR 65177, Oct. 31, 2008]

§ 56.30-3 Piping joints (reproduces 110).

The type of piping joint used shall be suitable for the design conditions and shall be selected with consideration of joint tightness, mechanical strength and the nature of the fluid handled.

§ 56.30-5 Welded joints.

(a) *General.* Welded joints may be used for materials for which welding procedures, welders, and welding machine operators have been qualified in accordance with part 57 of this subchapter.

(b) *Butt welds—general.* Butt welds may be made with or without backing or insert rings within the limitations established in § 56.70-15. When the use of backing rings will result in undesirable conditions such as severe stress concentrations, corrosion or erosion, then:

(1) The backing rings shall be removed and the inside of the joint ground smooth, or

(2) The joint shall be welded without backing rings, or

(3) Consumable insert rings must be used. Commonly used types of butt welding end preparations are shown in ASME B16.25 (incorporated by reference; see 46 CFR 56.01-2).

(4) Restrictions as to the use of backing rings appear for the low temperature piping systems and should be checked when designing for these systems.

(c) *Socket welds (Modifies 127.3.3A.).*

(1) Each socket weld must conform to ASME B16.11 (incorporated by reference; see 46 CFR 56.01-2), to applicable standards listed in 46 CFR 56.60-1, table 56.60-1(b), and to Figure 127.4.4C in ASME B31.1 (incorporated by reference; see 46 CFR 56.01-2) as modified by § 56.30-10(b)(4) of this part. A gap of approximately one-sixteenth inch between the end of the pipe and the bottom of the socket must be provided before welding. This may best be provided by bottoming the pipe and backing off slightly before tacking.

(2) Socket welds must not be used where severe erosion or crevice corrosion is expected to occur. Restrictions on the use of socket welds appear in § 56.70-15(d)(3) of this part for Class I service and in § 56.50-105 of this part for

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low temperature service. These sections should be checked when designing for these systems. See § 56.70-15(d)(4) of this part for Class II service.

(3) (*Reproduces 111.3.4.*) Drains and bypasses may be attached to a fitting or valve by socket welding provided the socket depth, bore diameter and shoulder thickness conform to ASME B16.11.

(d) *Fillet welds.* A fillet weld may vary from convex to concave. The size of a fillet weld is determined as shown in Figure 127.4.4A of ASME B31.1. Fillet-weld details for socket-welding components must meet § 56.30-5(c). Fillet-weld details for flanges must meet § 56.30-10 of this part (see also § 56.70-15(d)(3) and (4) of this part for applications of fillet welds).

(e) *Seal welds.* Seal welds may be used but shall not be considered as contributing any strength to the joint.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 77-140, 54 FR 40605, Oct. 2, 1989; CGD 95-012, 60 FR 48050, Sept. 18, 1995; USCG-2003-16630, 73 FR 65177, Oct. 31, 2008]

§ 56.30-10 Flanged joints (modifies 104.5.1(a)).

(a) Flanged or butt-welded joints are required for Classes I and I-L piping for nominal diameters exceeding 2 inches, except as otherwise specified in this subchapter.

(b) Flanges may be attached by any method shown in Figure 56.30-10(b) or by any additional means that may be approved by the Marine Safety Center. Pressure temperature ratings of the appropriate ANSI/ASME standard must not be exceeded.

(1) *Figure 56.30-10(b), Method 1.* Flanges with screw threads may be used in accordance with 46 CFR 56.30-20, table 56.30-20(c).

(2) *Figure 56.30-10(b), Method 2.* ASME B16.5 (incorporated by reference; see 46 CFR 56.01-2) Class 150 and Class 300 low-hubbed flanges with screw threads, plus the addition of a strength fillet weld of the size as shown, may be used in Class I systems not exceeding 750 °F or 4 NPS, in Class II systems without diameter limitations, and in Class II-L systems not exceeding 1 NPS. If 100 percent radiography is required by 46 CFR 56.95-10 for the class, diameter, wall thickness, and material of pipe

being joined, the use of the threaded flanges is not permitted and butt-welding flanges must be provided. For Class II piping systems, the size of the strength fillet may be limited to a maximum of 0.525 inch instead of 1.4T.

(3) *Figure 56.30-10(b), Method 3.* Slip-on flanges meeting ASME B16.5 may be used in piping systems of Class I, Class II, or Class II-L not to exceed the service pressure-temperature ratings for flanges of class 300 and lower, within the temperature limitations of the material selected for use, and not to exceed 4-inch Nominal Pipe Size (NPS) in systems of Class I and Class II-L. If 100 percent radiography is required by 46 CFR 56.95-10 for the class, diameter, wall thickness, and material of the pipe being joined, then slip-on flanges are not permitted and butt-welding flanges are required. The configuration in Figure 127.4.4B(b) of ASME B31.1 (incorporated by reference; see 46 CFR 56.01-2), using a face and backweld, may be preferable where eliminating void spaces is desirable. For systems of Class II, the size of the strength fillet may be limited to a maximum of 0.525 inch instead of 1.4T, and the distance from the face of the flange to the end of the pipe may be a maximum of three-eighths of an inch. Restrictions on the use of slip-on flanges appear in 46 CFR 56.50-105 for low-temperature piping systems.

(4) *Figure 56.30-10(b), Method 4.* ASME B16.5 socket welding flanges may be used in Class I or II-L systems not exceeding 3 NPS for class 600 and lower class flanges and 21/2NPS for class 900 and class 1500 flanges within the service pressure-temperature ratings of the standard. Whenever full radiography is required by 46 CFR 56.95-10 for the class, diameter, and wall thickness of the pipe being joined, the use of socket welding flanges is not permitted and a butt weld type connection must be provided. For Class II piping, socket welding flanges may be used without diameter limitation, and the size of the fillet weld may be limited to a maximum of 0.525 inch instead of 1.4T. Restrictions on the use of socket welds appear in 46 CFR 56.50-105 for low temperature piping systems.

(5) *Figure 56.30-10(b), Method 5.* Flanges fabricated from steel plate